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"IMMUNIZATION: AWARENESS AND ANALYSIS: SPECIAL REFERENCE TO CAPITAL STATE OF DELHI"

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ABSTRACT

Awareness about the basic understanding and importance of immunization is crucial. Immunization refers to the process where the body induces immunity to a disease as a result of a vaccine. The World Health Organization considers immunization to be the most effective medical intervention we have to prevent deaths and reduce disease in our communities. Immunization is the process whereby a person is made immune or resistant to an infectious disease. Immunization is a proven tool for controlling and eliminating life-threatening infectious diseases and is estimated to avert between 2 and 3 million deaths each year. It is one of the most cost-effective health investments, with proven strategies that make it accessible to even the most hard-to-reach and vulnerable populations. It has clearly defined target groups. Immunization is done, typically by the administration of a vaccine. Vaccines stimulate the body's own immune system to protect the person against subsequent infection or disease. A vaccine is a product made from dead or alive, weakened strains of viruses or bacteria. Vaccination refers to the act of giving a vaccine to a person. When a vaccine is given it triggers an immune response in your body. This protects you if you come into contact with strains of that disease again in the natural environment. The prime objective of the study is to analyze the relationship between the Awareness of vaccination of the survey responder and the corresponding immunization through a survey which has been conducted on 431 families across the NCR Delhi. The Pearson's chi-squared test (χ^2) has been performed to check the dependence and depth of relationship which the data intends to imply. The secondary objectives of the research paper are to study the different types of vaccines and identification of the various Factors Affecting awareness towards vaccination.

INTRODUCTION

All immunizations work in the same way. The vaccination uses your body's immune system to increase protection to an infection before you come into contact with that

infection [1]. In other words, it is like being infected by the disease without suffering the actual symptoms.

If you come into contact with an infection after you've been vaccinated, your body works to stop you from getting the disease, or you may get just a mild case. Unlike other proposed approaches to immunization (such as homeopathy), vaccinations have been rigorously tested to demonstrate their safety and effectiveness in protecting against infectious disease.

When enough people in the community are vaccinated, the spread of a disease slows down or stops completely. So as long as majority of the people are vaccinated, the disease will not spread. This is called herd immunity. It takes a long time to develop a new vaccine, usually between 10 and 15 years. The development process is rigorous and the vaccine is constantly monitored – even after it is being used – to make sure it is safe and effective. A new vaccine goes through many phases of development, including research, discovery, pre-clinical testing, clinical testing (which can take up to seven years or more) and regulatory approval. Once the vaccine is approved (another lengthy process of up to two years), the vaccine is then manufactured and shipped to affected areas.

OBJECTIVES:

1. To study the different types of vaccines.
2. To identify the various Factors Affecting Vaccination Awareness
3. To analyze the relationship between the Awareness of vaccination of the survey responder and the corresponding immunization.

RESEARCH METHODOLOGY

A survey has been conducted and cross-tabulated for Bivariate Data Analysis in a diverse number of ways, as per requirement, and Pearson's chi-squared test (χ^2) has been performed to check the dependence of the tabulated parameters and depth of relationship which the data intends to imply. The sample size of 431 families was surveyed to find out the results upon application of the Data Analysis.

TYPES OF VACCINES

Vaccines are divided into four major categories while considering the different factors affecting the vaccination, they are:

1. Live-attenuated
2. Inactive vaccines
3. Subunit, recombinant, polysaccharide & conjugate
4. Toxoid vaccines

Live-attenuated:

This vaccination method uses the weakened germs that causes the particular kind of disease. Since these vaccination are so similar to the live germs that they immune our body system for a longer duration of time. Only one or two dosage of this vaccination will help us secure for lifetime.

The diseases that are prevented by using this kind of vaccination are:

- Yellow Fever
- Measles
- Mumps
- Rubella
- Smallpox
- Chickenpox

Inactive Vaccines:

This vaccination technique uses dead form of the germ of that particular disease. The Inactive vaccine is not as strong as Live vaccination hence you have to take several dosage of Inactive vaccine to keep preventing the particular kind of disease.

The diseases that can be prevented by applying this kind of vaccination are:

- Hepatitis A
- Flu
- Polio
- Rabies

Subunit, recombinant, polysaccharide & conjugate

This kind of vaccination uses the pieces of the germ that cause the particular kind of disease. The particular pieces such as the protein, sugar or capsid. Since this kind of vaccination uses the particular pieces hence it can prevent the disease from occurring for a long time period.

The disease that can be prevented by consuming this kind of vaccination are:

- Haemophilus Influenzae type B
- Hepatitis B
- HPV
- Whooping cough
- Pneumococcal disease
- Shingles

Toxoid Vaccines:

This kind of vaccines uses a toxin, a harmful product, made by the germs that cause the disease. The vaccine does not affect the germ as a whole but it affects the harmful part of the germ hence providing the immunity from the particular disease. The disease that can be prevented by using this kind of vaccination are:

- Diphtheria
- Tetanus

Routes of administration of vaccines are:

1. Deep subcutaneous or intramuscular route
2. Oral route
3. Intradermal route
4. Scarification
5. Intranasal Route

These methods of administration of vaccines do not require any subsequent change in your life style. Vaccination are important in every stage of our life from the childhood to the adulthood we are required to be vaccinated according to the requirements. There are several diseases which are serious and can be dangerous in infants and in very young children, hence to protect them from these several disease we require proper vaccination that should be provided to them [10]. The disease that can be caused in infants due to infection are chickenpox, measles, whooping cough. In addition to all the childhood vaccines induced into the children, they again require several kind of vaccination in their pre-teen and teenage to prevent them from disease like meningitis, cancer caused by HPV, flu, whooping cough.

While vaccination is required in adults too for several reasons like:

- The childhood vaccines wears off with time;

- Some of the viruses of particular disease changes with time;
- Some new vaccines might be introduced during the time span which is required now.

Considering all these conditions we can see that there is no way we can avoid the immunization process through vaccination.

Though vaccination is particularly recommended if person is:

- A newborn or young child
- Having a new born baby
- Pregnant or planning for a baby
- Caring for very young babies
- An older person
- Making plans to travel outside country
- Medically at risk due to certain condition

Some of the common diseases which we can forget by just having proper vaccinations are:

- Diphtheria
- Chickenpox
- Mumps
- Rotavirus
- Pneumococcal Disease
- Whooping cough
- Measles
- HiB
- Rubella
- Hepatitis A
- Hepatitis B
- Flu
- Tetanus
- Polio

Immunization is one of the best ways you can protect yourself, your children and future generations from infectious diseases. In other words, if you vaccinate, you help wipe out disease that could spread now and into the future. By making sure you and your family are fully vaccinated, you are not only looking after your own family but also protecting vulnerable people in your community[6]. And you are also helping in wiping out these infectious diseases altogether. That is, more the people vaccinate, fewer the people are infected, and thus the less widely disease can spread [7].

While there are different campaigns organised for the immunization and vaccination programs, there are still lack of awareness among the certain communities about these method. The lack of education or awareness campaign increases the chance of less immunization through vaccination [8].

Considering the condition of polio disease in India during the late 90s and early 2000s, there was an increase in the number of cases of polio, In 2009 India reported 741 polio cases, more than any country in the world. The country faced many ground level challenges like high population density, birth rate, poor sanitation, inaccessible terrain and reluctance of a section to accept polio vaccination.

While facing all these sort of difficulties, the government with the help of Health Organizations like WHO and UNICEF, Rotary club and millions of front-line workers achieved the featuring of polio free nation. The country used different means of advertisement by the religious or community leader to encourage people for the vaccination, the use of social mobiliser helped in spreading more about the several campaigns associated with polio vaccination. In 2010 Oral vaccination was also introduced in India, which was also a key factor in eradicating polio from India. India was declared a polio free nation on March 27, 2014 by the Independent team of World Health Organization [4].

These kinds of methods can also be used to spread awareness about the several diseases and its vaccination and immunization.

FACTORS AFFECTING VACCINATION AWARENESS

1.1. Role of education

Lack of education and a mere absence of awareness in the local field was the prime reason for abysmal state of penetration of vaccination in the rural India. Parents were not aware of the importance of the vaccine administered to the children. The government scheme whereby these basic health care facilities are provided free of cost is also not made aware to them, this furthers the need for a proper sensitization in areas particularly the rural ones [9].

1.2. Infrastructure

Lack of proper infrastructure in the rural area of India fails in providing proper vaccination measures for people residing there. There are no proper supply of basic medicine and vaccines. The new born are not able to have the basic important immunization like BGC, OPV (0), Hep B Birth dose which is to be provided at the place of delivery.

1.3. Workforce

Primary Health Centre of India lack in the workforce,i.e. the doctors and nurses in

different are PHC all over the country. According to the Rural Health Statistics 2017, 78,569 sub-centres are without male health workers, 6,371 without auxiliary nurse midwives and 4,261 without either out of the 1,56,231 sub-centres. The lack of workers results in people being attended by the health centre on a daily basis.

1.4. Awareness

Social awareness is also a key factor that can be considered for the lack of vaccination and immunization. There are still several myths that are still prevailing in the minds of Indian parents regarding the vaccination. The boost of social media is increasing the myths while on other hand credible sources are taking help of social media and different media platform to spread the correct facts and awareness about it. Hence people should be aware enough about the source of the information and then act accordingly.

INFERENCES DRAWN FROM DATA SET

It has been proven over the ages that our minds find it easier to assess, analyze and understand data, status and progress in terms of numeric figure. Thus it is important that we quantify the status of healthcare, the magnitude of dependence of various relationships and other factors, for us to better process the data. A couple of simple yet strong tools that facilitate this endeavor are namely survey and tabulation. A survey has been conducted and cross-tabulated for Bivariate Data Analysis in a diverse number of ways, as per requirement, and Pearson's chi-squared test (χ^2) has been performed to check the dependence of the tabulated parameters and depth of relationship which the data intends to imply [3]. The sample size of 431 families was surveys to find interesting results upon application of the Data Analysis.

Cross tabulation helps to understand how two different variables are related to each other. For example, suppose we wanted to see if there is a relationship between the Awareness of vaccination of the survey responder and if having Immunized Children is important [5]. Using the survey data, we can count the number of people who have the Awareness of vaccination and also who have Immunized their Children, and the number of people being aware about vaccination but have not Immunized their Children or think that Immunizing their Children is not important. We then take this information and create a contingency table, which displays the frequency of each of the variables displayed below showing Frequency Distribution of Awareness of vaccination Vs. Immunized Children. Bivariate analysis is one of the simplest forms of quantitative (statistical) analysis It involves the analysis of two variables (often denoted as X, Y), for the purpose of determining the empirical relationship between them

Bivariate Data Analysis of Awareness of vaccination Vs Immunized Children			
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Case Processing Summary

	Cases		
	Valid	Missing	Total

	N	Percent	N	Percent	N	Percent
Awareness of vaccination * Immunized Children	431	100.0%	0	0.0%	431	100.0%

Table 1: Frequency Distribution of Awareness of vaccination vs Immunized Children Count

Suppose that there are 431 respondents who completed the survey, 100% being present in dataset and 0% Missing information about the respondents. Here is what our cross tabulation looks like:

Crosstab

		Immunized Children			Total
		NA	Yes	No	
Awareness of vaccination	NA	5	3	4	12
	Yes	6	82	26	114
	Yes, and Not at all	25	91	99	215
	No	13	34	43	90
Total		49	210	172	431

Table 2: Cross tabulation data Awareness of vaccination vs Immunized Children Count

So, we need to see that weather there is a relationship between Awareness of vaccination and presence of Immunized Children. If we look at the table, we can see that 210(48.72%) almost half all of the respondents have Immunized their Children, to see how many of them have Awareness of vaccination process is only 82 (39%) and only 12 (0.27%) are not aware of the vaccination process at all. Although 26 (0.60%) of population which is really small amount who knows about vaccination process and still does not have their children Immunized. Therefore, certain public policies or advertisements should be made to create the awareness towards vaccination which will promote the good health of people.

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	44.105 ^a	6	.000
Likelihood Ratio	41.331	6	.000
Linear-by-Linear Association	6.193	1	.013
N of Valid Cases	431		

Table 3: Chi-Square Test Table

Pearson's chi-squared test (χ^2) is a statistical test applied to sets of categorical data to evaluate how likely it is that any observed difference between the sets arose by chance. It is suitable for unpaired data from large samples. When reading this table, we are interested in the results of the "Pearson Chi-Square" row. We can see here that Pearson Chi-Square = 44.105, $p = .0001$. This tells us that there is statistically significant association between Awareness of vaccination and Immunized Children; that is, Awareness of vaccination helps in having Immunized Children.

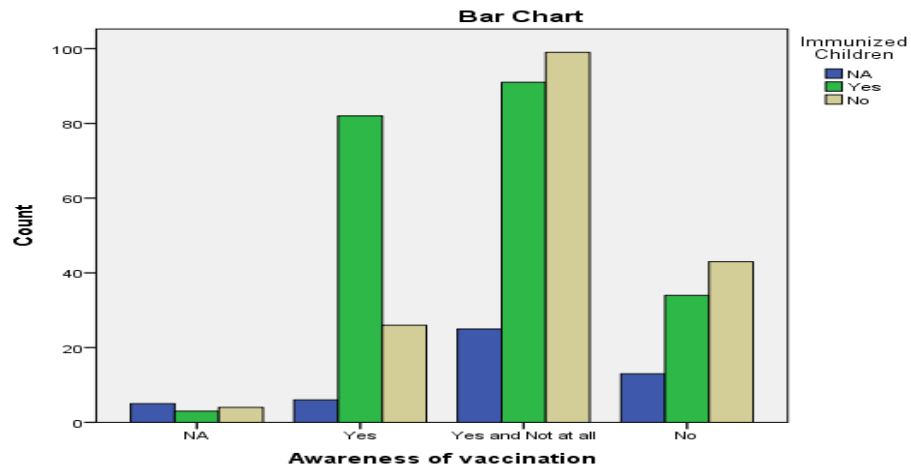


Figure 1: Bivariate Data Analysis of Immunization of Children & Awareness of vaccination

CONCLUSION

After analyzing the data that is processed after the survey report, we can see that almost half of the respondents have Immunized their Children, while the percentage of respondents aware about the vaccination process are only 39%. The data shows a clear picture that the people are not well aware about the vaccination process and its importance in their life. Hence we have to consider different and new methods to spread the awareness about vaccination after seeing its importance in a person’s life. We can introduce new interactive methods with the help of new technologies to reach out every corner and provide them with the necessary knowledge.

A low percentage of 0.60% population are aware about the vaccination process but still have not Immunized their children, this can be due to the lack of resources in the specified area. This suggests that not only by spreading awareness we can solve the problem, but also we have to work on the different parameters and problems to achieve 100% success.

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